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ABSTRACT

This paper emphasizes the need for empirical research and objective discovery procedures in semantics, and illustrates a method by which these goals may be obtained. The aim of the methodology described is to provide a description of the internal structure of a semantic field by eliciting the description--in an objective, standardized manner--from a representative group of native speakers. This would produce results that would be equally obtainable by any linguist using the same method under the same conditions with a similarly representative set of informants. The standardized method suggested by the author is the Semantic Differential developed by C. E. Osgood in the 1950's. Applying this method to semantic research, it is further hypothesized that, should different members of a semantic field be employed as concepts on a Semantic Differential task, a factor analysis of the results would reveal the dimensions operative within the body of data. The author demonstrates the use of the Semantic Differential and factor analysis in an actual experiment. (Author/VM)

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Transcript of a paper presented to the XIII AULLA Congress, Monash University, 1970, describing an investigation carried out by the author in Germany in 1968-9.

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AN EXPERIMENTAL METHOD FOR SEMANTIC FIELD STUDY

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There has been till now almost a total lack of empirical research in semantics. Although in this century much has been written about semantic structures of one kind or another, there has been little attempt to establish objective discovery procedures. The writings of the leading German linguist Leo Weisgerber contain much on the subject of semantic fields - Wortfelder - but his descriptions of actual fields are few and even then distinguished by an unmistakable subjectivity. For example, his treatment of the nouns in the semantic group Verstoss, Verbrechen etc. consists in compression of the field into a 7 x 7 matrix, i.e., an arrangement with seven categories on each of two co-ordinates, producing a set of 29 compartments, each of which just happens, happily, to be filled with exactly one member of the field. This arrangement as a description of a field, may of course be criticised as obviously unnecessarily constrained and artificial - which it indubitably is - but it is impossible to decide on its accuracy without having some objective method of testing this - in other words, of replicating the investigation. The only way of achieving replicable results in semantics, as in any other descriptive linguistic investigation, is to obtain them in some objective, standardised way from a representative group of informants. That is exactly what the present investigation was intended to achieve.

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The aim was to provide a description of the internal structure of a semantic field without relying on the linguistic competence of the individual linguist, but instead by eliciting the description - in an objective, standardised manner - from a representative group of native speakers. The results would then be equally obtainable by any linguist using the same method under the same conditions with a similarly representative set of informants - and note that the linguist would not necessarily have to possess perfect mastery of the language under investigation; in fact, it is conceivable he need not speak it at all. Any linguistic assertion made on the basis of a set of results obtained by such a method are thus entirely testable.

A standardised method was in fact available for this purpose in the so-called Semantic Differential, developed by the psycholinguist C. E. Osgood in the 1950's and described in the book Osgood, C.E., Suci, G.J. & Tannenbaum, P.H. The Measurement of Meaning (Urbana, Illinois, 1957). The method is designed to fulfil three conditions under which linguistic encoding can be used as a meaning-index: 1. there must be a carefully chosen set of alternative responses standardised for all subjects, thus eliminating problems arising from both the impossibility of comparing unlimited output and differences in facility of encoding; 2. these responses must be elicited from the informant rather than produced spontaneously; 3. the alternatives must be representative of the dimensions in which meanings vary. The first and second of these conditions are fulfilled in the form of the testing method, which consists of a set of bipolar sevenpoint scales, the two poles of each scale

consisting of adjectives of opposite meaning; on these scales a set of concepts to be compared must be ranked by the informant. In the example below (fig. 1), e.g., the informant would be required to decide whether

FATHER

fast _ _ _ _ _ _ _ slow
happy _ _ _ _ _ _ _ sad
strong _ _ _ _ _ _ _ weak

etc.

Fig. 1 Simple Semantic Differential form

the concept FATHER was to him very fast, very slow, quite fast etc. The third condition was fulfilled by an exhaustive preliminary investigation carried out by Osgood and his co-workers which showed up high correlations between separate adjective-pairs, on the basis of which a very small number of factors sufficed to account for the variance within the total set of polarities. In practice this means that a quite small randomly chosen set of polarities will give equivalent results to, say, all the polarities in the language. (With considerably less wear and tear on the informant completing the test).

Despite the title of Osgood's book, the Semantic Differential has never been used in pure linguistic research, but chiefly in opinion research (market research, political forecasting), in personality research, psychotherapy, etc.

In the present investigation it was hypothesised that should different members of a semantic field be employed

as concepts on a Semantic Differential task, a factor analysis of the results would reveal the dimensions operative within the body of data, .e. the dimensions in which these members of a semantic field - defined as such by virtue of their similarity - vary, are distinguished from one another.

The text example was the semantic field from modern German böse, schlecht. Because the investigation was in the nature of a pilot study, the number of members of the field brought under investigation was limited - limited in fact to the number an informant can cope with in about twenty minutes, which is about as much time as is reasonable to ask of a voluntary unpaid informant! The following ten words from the field were selected:

böse, ekelhaft, entsetzlich, fürchterlich, grässlich, scheusslich, schlecht, schlimm, schrecklich, widerlich.

It must be stressed that this semantic field as such was not of primary interest in the investigation, but emphasis was laid rather on the methodological aspect - would the method show up where the differences lay between inherently similar words.

Eight adjective pairs were randomly chosen from Osgood's Thesaurus study (see Measurement of Meaning) and translated into German by the author. They were:

bunt - farblos
leise - lärmend
reif - unreif
männlich - weiblich
menschlich - tierisch
alt - jung
dauerhaft - vorübergehend
absichtlich - unabsichtlich

The choice of these particular eight scales rather than any others should exercise no influence on the results, since any randomly chosen set of polarities will give in theory identical measurements; it is the dimensions, after all, in which the concepts vary, i.e. the correlations between the ranked concepts, which are of interest.

Sixty-four native speakers of German resident in West and East Germany completed the Semantic Differential task. Space does not permit here a complete statistical breakdown of the informant sample, but this was in the author's opinion fairly representative of the general population with the exception that it included perhaps rather more informants with academic training than would a totally unbiassed sampling.

A factor analysis was carried out on the results, using Osgood's D-method of factoring. (This method makes use of raw scores rather than correlation coefficients, but is mathematically equivalent to the classical techniques of Thurstone).

Three factors were extracted, accounting in toto for 95.37% of the variance within the data. Of this, Factor I accounted for 74.67%, Factor II for 16.81% and Factor III for 3.90%. The analysis was discontinued at this point, since it was felt that a fourth factor would account for approximately an insignificant 0.1% of the variance, possibly even less. 4.62% of the total variance was therefore unaccounted for. Fig. II shows the loadings for each of the ten concepts in each factor. It can be seen that Factor I exhibits a high positive loading for each concept, whereas there are an equal number of positive and negative loadings on Factor II; Factor III exhibits positive

loadings for most concepts, with widerlich alone receiving negative loading. The null loadings in Factors II and III are a statistical artefact produced by the need for a pivot concept in each factor; they do not affect the validity of the grouping.

	Factor I	Factor II	Factor III
böse	0.82	0.93	0.65
ekelhaft	0.95	0.28	0.20
entsetzlich	1.34	-0.10	0.16
fürchterlich	1.23	-0.39	0.29
grässlich	1.53	0.00	0.00
scheusslich	1.14	-0.01	0.11
schlecht	0.82	1.18	0.00
schlimm	0.97	0.43	0.23
schrecklich	1.34	-0.09	0.02
widerlich	0.90	0.42	-0.18

Fig. II Factor loadings for each concept

This is as far as the factor analysis takes us. It has isolated the dimensions in which these "synonyms" vary, and up to this point the investigation is objective and totally replicable. The interpretation of the factors is the responsibility of the individual linguist and can be challenged. In this case interpretation is however fairly straightforward.

Factor I, exhibiting high positive loadings for all field members, is a general factor of correlation confirming the existence of a semantically meaningful grouping, i.e. confirming the fact that these ten words belong to the same semantic field. Had the loadings in the first factor shown any other configuration, serious doubt would have been cast on the validity of the results.

Factor II, on which schlecht has the highest loading, whereas five concepts (all with the suffix - lich) receive negative loadings, can best be interpreted as a factor of intensity, saturatinn of content. This can be illustrated by comparing the sentences:

(1) Er ist ein schlechter Mensch.
(2) Er ist ein fürchterlicher Mensch

It is readily appreciated that the character judgement given in (1) is more damning! Independent evidence for the validity of this interpretation is provided by the fact that those adjectives receiving negative loadings in this factor are exactly those which may be used to modify other adjectives (indeed, even other adjectives of quite opposed meaning), as in the sentence:

(3) Das ist doch schrecklich nett von dir!

and may thus properly be regarded as less saturated with their "proper" meaning.

Factor III, finally, produces the highest loading for böse, with the remaining concepts receiving mainly positive loadings and by widerlich being negatively loaded. This allows interpretation as a factor of intentionality; compare the sentences:

(4) Sei nicht böse!
(5) Sei nicht schrecklich!

and it will be seen that (4) is normal, whereas (5) is anomalous. Likewise, the separation on this concept of ekelhaft (positive loading) and widerlich (negative loading), which have received

highly similar loadings on previous factors, supports this interpretation, as ekelhaft can be conceived as more "intentional" than widerlich; cf.:

(6) Er benimmt sich ekelhaft

(7) Er benimmt sich widerlich

where (7) is anomalous.

The test method has thus revealed three dimensions which are relevant for the description of the internal relations of this semantic field. Fig. III, below, in which Factors II and III are plotted against each other, gives a diagrammatical representation of the structure of this section of the field, where it can be seen that grässlich, scheusslich, schrecklich, entsetzlich form a clear group, from which ekelhaft is distinguished by a greater loading on Factor II, intensity, fürcheterlich on the other hand by a lesser loading on this factor. Widerlich is to some extent set apart by a smaller loading on Factor III, schlecht by its very high loading of "intensity" böse by high loadings on both factors. Exigencies of space unfortunately preclude any elaboration of this admittedly sketchy report. It may seem little to have described only the interconnexions of ten closely related words, which in themselves do not form an exhaustive semantic grouping, but it is submitted that the reported results indicate that a similar analysis of the totality of a semantic field would be exciting.

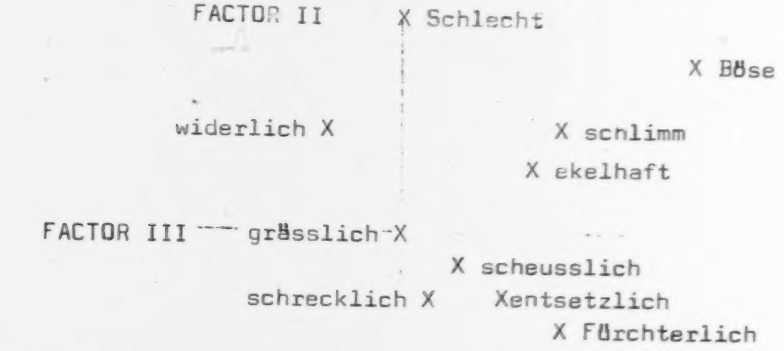

Fig. III Plotted loadings in Factors II and III

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